CONCEPT

AI for Schedule Risk Analysis, Project Forecasting and Programme Reporting

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Technical depth: Practitioner · **Practical mode:** Lab

Introduction

Programme reports often arrive late, repeat what the schedule already shows and forecast completion dates that few people believe. Planners spend days cleaning data rather than analysing risk, while the signals of slippage sit unused in past schedules. This Core Concept course shows project controls practitioners how to combine established schedule risk methods with machine learning and generative AI to test schedule quality, forecast credible completion ranges and automate programme reporting under proper governance. Working hands on with schedule data, participants build an AI-Assisted Schedule Risk and Forecast Pack.

Course Objectives

- Assess schedule quality and data readiness with a 14-point schedule health check before any analysis is run
- Run quantitative schedule risk analysis with Monte Carlo simulation in line with AACE 57R-09 and interpret P50 and P80 results
- Build and validate machine learning models that predict activity delay and completion dates from historical schedule data
- Apply earned schedule and reference class forecasting to challenge optimistic programme forecasts
- Automate programme reports and narrative commentary with generative AI while controlling accuracy and data risk
- Produce an AI-Assisted Schedule Risk and Forecast Pack for a live programme

Target Audience

- Planning and scheduling practitioners who build and update project schedules
- Project controls analysts responsible for progress measurement and forecasting
- Risk analysts who run quantitative schedule and cost risk assessments
- PMO reporting analysts who prepare programme and portfolio dashboards
- Programme data and business intelligence analysts supporting delivery teams

Course Outline

Day 1: AI in Project Controls and Schedule Data Readiness

- AI, Machine Learning and Generative AI Use Cases in Project Controls
- Schedule Quality Review with a 14-Point Schedule Health Check
- Critical Path Logic, Float and Constraint Diagnostics
- Historical Schedule Data Inventory and Data Quality Profiling
- Baseline, Update and Actuals Extraction from Primavera P6 and Microsoft Project

Day 2: Schedule Risk and Forecasting Methods

- Quantitative Schedule Risk Analysis with Monte Carlo Simulation
- AACE 57R-09 Risk Drivers Method for Integrated Cost and Schedule Risk
- Earned Schedule Metrics: SPIt and Independent Completion Estimates
- Reference Class Forecasting and Optimism Bias Adjustment
- ISO 31000 and ISO/IEC 23894 Risk Principles for AI-Supported Forecasts

Day 3: Building Predictive Models in the Lab

- Feature Engineering from Activity Attributes, Logic and Progress History
- Delay Prediction with Gradient-Boosted Regression in Python scikit-learn
- Model Validation: Train-Test Split, Mean Absolute Error and Prediction Intervals
- Probabilistic Completion Forecasts: P50, P80 and S-Curve Outputs
- Delay Driver Explanation with SHAP Values and Tornado Charts

Day 4: AI Reporting, Governance and Failure Modes

- Automated Programme Dashboards in Power BI with Forecast Feeds
- Generative AI Narrative Commentary: Prompt Templates and Fact-Checking Rules
- Model Drift, Bias and Overfitting Warning Signs
- NIST AI RMF and ISO/IEC 42001 Controls for Forecasting Tools
- Data Confidentiality and Human Review Gates for AI-Generated Reports

Day 5: Lab Work and the Forecast Pack

- Transport Programme Lab: Schedule Health Check and Monte Carlo Run
- Energy Project Lab: Delay Prediction Model Build and Validation
- AI-Assisted Monthly Programme Report Production
- AI-Assisted Schedule Risk and Forecast Pack Assembly
- Mock Programme Board Review and Forecast Defence

Skills You Will Gain

- Schedule Quality Analysis
- Quantitative Schedule Risk Analysis
- Predictive Modelling
- Forecast Validation
- Earned Schedule Analysis
- AI Risk Governance
- Automated Reporting
- Data Preparation for Analytics

Why Attend This Course

- Return with an AI-Assisted Schedule Risk and Forecast Pack for a live programme, tested in the lab and by peers
- Give programme boards completion ranges backed by data instead of single dates that few believe
- Cut the time spent assembling monthly reports and redirect it to analysing what drives slippage
- Know when an AI forecast should be trusted, questioned or set aside

Conclusion

Programme forecasts earn trust when they rest on sound schedules, tested methods and transparent models. This course moves from schedule health and data readiness, through Monte Carlo, earned schedule and reference class methods, to building and validating predictive models and automating reports under clear governance. The final day brings these together in hands-on lab work, producing an AI-Assisted Schedule Risk and Forecast Pack that participants can apply in the next reporting cycle and defend in front of their programme board.